

What is claimed is:

1. A protective device including a plurality of line terminals configured to be connected to an electrical distribution system and a plurality of load terminals configured to be connected to a load, comprising:
 - a fault detection circuit coupled to the plurality of line terminals and the plurality of load terminals, the fault detection circuit being configured to detect at least one fault in the electrical distribution system;
 - a power interruption circuit coupling the plurality of line terminals to the plurality of load terminals to thereby provide power to the load under normal operating conditions, the power interruption circuit also being coupled to the fault detection circuit and configured to decouple the plurality of line terminals from the plurality of load terminals in response to the fault detection circuit detecting the at least one fault; and
 - a test circuit coupled to the fault detection circuit and the power interruption circuit, the test circuit being configured to provide a simulated fault signal to the fault detection circuit in response to a user stimulus, the test circuit including an end-of-life alarm indicator, the end-of-life alarm indicator being configured to provide an end-of-life alarm if the fault detection circuit and/or power interruption circuit fails to respond to the simulated fault signal within a predetermined period of time.
2. The device of claim 1, wherein the fault detection circuit is configured to detect a ground fault condition.
3. The device of claim 1, wherein the fault detection circuit is configured to detect an arc fault condition.
4. The device of claim 1, wherein the protective device is configured as a receptacle.

5. The device of claim 1, wherein the protective device is configured as a switch.
6. The device of claim 1, wherein the protective device is disposed in a circuit breaker.
7. The device of claim 1, wherein the protective device is disposed in a module or portable housing.
8. The device of claim 1, wherein the end-of-life alarm indicator includes a visual alarm indication.
9. The device of claim 8, wherein the visual alarm indicator includes at least one light emitting diode.
10. The device of claim 9, wherein the at least one light emitting diodes includes a plurality of light emitting diodes configured to provide a plurality of indications.
11. The device of claim 10, wherein the plurality of indicators includes a trip indicator.
12. The device of claim 10, wherein the plurality of indicators includes a pilot light.
13. The device of claim 10, wherein the plurality of indicators includes a locator light.
14. The device of claim 8, wherein the visual alarm indicator includes human readable indicia.
15. The device of claim 8, wherein the visual alarm indicator includes a lamp display.
16. The device of claim 8, wherein the visual alarm indicator provides a periodic flashing light to indicate end-of-life.

17. The device of claim 16, wherein the visual alarm indicator provides a continuous non-flashing light to indicate a condition other than end-of-life indication.
18. The device of claim 1, wherein the end-of-life alarm indicator includes an audible alarm indicator.
19. The device of claim 18, wherein the audible alarm indicator provides a periodic sound to indicate the end-of-life condition.
20. The device of claim 1, wherein the end-of-life alarm indicator includes an RF alarm indication signal.
21. The device of claim 20, wherein the RF alarm indication signal is interpreted by a remote facility.
22. The device of claim 20, wherein the RF alarm indication signal is adapted to a wireless communications format.
23. The device of claim 1, wherein the end-of-life alarm indicator is transmitted by a wireline facility.
24. The device of claim 1, wherein the fault detection circuit further comprises:
 a sensor coupled to at least one line terminal and/or load terminal among the plurality of line terminals and/or the plurality of load terminals, the sensor being configured to sense the at least one fault and provide a fault sensing signal; and
 a detector coupled to the sensor, the detector being configured to interpret the fault sensing signal and detect the at least one fault.
25. The device of claim 1, wherein the power interruption circuit further comprises:

a switch mechanism coupled to the fault detection circuit, the switch mechanism being actuated in response to the fault detection circuit detecting the at least one fault; and
a trip mechanism coupled to the switch mechanism, the trip mechanism being configured to decouple the plurality of line terminals from the plurality of load terminals in response to a signal from the switch mechanism.

26. The device of claim 25, wherein the switch mechanism includes a solenoid.

27. The device of claim 25, wherein the trip mechanism includes interrupting contacts configured to decouple the plurality of line terminals from the plurality of load terminals.

28. The device of claim 1, wherein the user stimulus generates an electrical signal.

29. The device of claim 1, wherein the user stimulus generates an optical signal.

30. The device of claim 1, wherein the user stimulus generates a wireless signal.

31. The device of claim 1, wherein the test circuit includes a test button and a contact, the test button being depressed by the user stimulus to thereby close the contact and generate the simulated fault signal.

32. The device of claim 1, further comprising an end-of-life indication circuit coupled to the test circuit, the end-of-life alarm indicator, and the power interruption circuit, the end-of-life indication circuit activating the end-of-life alarm if the fault detection circuit and/or power interruption circuit fails to respond to the simulated fault signal within a predetermined period of time.

33. The device of claim 32, further comprising a resettable latch configured to be latched by the simulated fault signal and unlatched by the power interruption circuit, the end-of-life indication circuit activating the end-of-life alarm if the fault detection circuit

fails to actuate the power interruption circuit in response to the simulated fault signal within a predetermined period of time.

34. The device of claim 33, wherein the resettable latch is reset by a removal and a restoration of a source of voltage.

35. The device of claim 32, further comprising a non-resettable latch configured to be latched by the simulated fault signal to thereby enable the end-of-life indication circuit to provide the end-of-life alarm, the non-resettable latch permanently enabling the end-of-life indication circuit if the fault detection circuit fails to actuate the power interruption circuit in response to the simulated fault signal within a predetermined time interval.

36. The device of claim 32, wherein the test circuit includes a test button and a contact, the test button being depressed by the user stimulus to thereby close the contact and generate the simulated fault signal.

37. The device of claim 36, wherein the closing of the contact generates the simulated fault signal and an end-of-life alarm signal to enable the end-of-life indication circuit.

38. The device of claim 37, further comprising a resettable latch configured to receive the end-of-life alarm signal and enable the end-of-life indication circuit in response thereto.

39. The device of claim 37, further comprising a non-resettable latch configured to receive the end-of-life alarm signal and enable the end-of-life indication circuit in response thereto.

40. The device of claim 32, wherein the end-of-life indication circuit provides the user with an end-of-life indication for the duration of the user stimulus of the test circuit.

41. The device of claim 32, wherein the at least one failure of the fault detection circuit or power interruption circuit prevents the plurality of line terminals from being coupled to the plurality of load terminals.

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42. A protective device including a plurality of line terminals configured to be connected to an electrical distribution system and a plurality of load terminals configured to be connected to a load, comprising:

- a fault detection circuit coupled to the plurality of line terminals and the plurality of load terminals, the fault detection circuit being configured to detect at least one fault in the electrical distribution system;
- a power interruption circuit coupling the plurality of line terminals to the plurality of load terminals to thereby provide power to the load under normal operating conditions, the power interruption circuit also being coupled to the fault detection circuit and configured to decouple the plurality of line terminals from the plurality of load terminals in response to the fault detection circuit detecting the at least one fault;
- a test circuit coupled to the fault detection circuit and the power interruption circuit, the test circuit being configured to provide a simulated fault signal to the fault detection circuit in response to a user stimulus;
- a resettable latch configured to be latched by the simulated fault signal from the test circuit and unlatched by the decoupling of the plurality of the line terminals from the plurality of load terminals by the power interruption circuit; and
- an end-of-life indication circuit coupled to the resettable latch, the end-of-life indication circuit providing the user with an end-of-life alarm indication if the resettable latch does not unlatch within a predetermined period of time.

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43. A protective device including a plurality of line terminals configured to be connected to an electrical distribution system and a plurality of load terminals configured to be connected to a load, comprising:

- a fault detection circuit coupled to the plurality of line terminals and the plurality of load terminals, the fault detection circuit being configured to detect at least one fault in the electrical distribution system;
- a power interruption circuit coupling the plurality of line terminals to the plurality of load terminals to thereby provide power to the load under normal operating conditions, the power interruption circuit also being coupled to the fault detection circuit and configured to decouple the plurality of line terminals from the plurality of load terminals in response to the fault detection circuit detecting the at least one fault;
- a test circuit coupled to the fault detection circuit and the power interruption circuit, the test circuit being configured to provide a simulated fault signal to the fault detection circuit in response to a user stimulus;
- a non-resettable latch configured to be permanently latched if the duration of the simulated fault signal from the test circuit is greater than a predetermined amount of time; and
- an end-of-life indication circuit coupled to the non-resettable latch, the end-of-life indication circuit providing the user with a permanent end-of-life alarm indication after the non-resettable latch has been latched.

44. A protective device including a plurality of line terminals configured to be connected to an electrical distribution system and a plurality of load terminals configured to be connected to a load, comprising:

- a fault detection circuit coupled to the plurality of line terminals and the plurality of load terminals, the fault detection circuit being configured to detect at least one fault condition;
- a power interruption circuit coupled to the fault detection circuit, configured to decouple the plurality of line terminals from the plurality of load terminals in response to the fault detection circuit detecting the at least one fault condition;

a test circuit coupled to the fault detection circuit and the power interruption circuit, the test circuit being configured to provide a simulated fault signal to the fault detection circuit in response to a user stimulus, the test circuit being configured to switch from an unlocked state to a lock-out state if the fault detection circuit fails to respond to the simulated fault signal within a predetermined period of time, the power interruption circuit being disabled from re-coupling the plurality of line terminals to the plurality of load terminals in the lock-out state; and

an end-of-life indication circuit coupled to the test circuit and the power interruption circuit, the end-of-life indication circuit providing the user with an end-of-life alarm indication in the lock-out state.